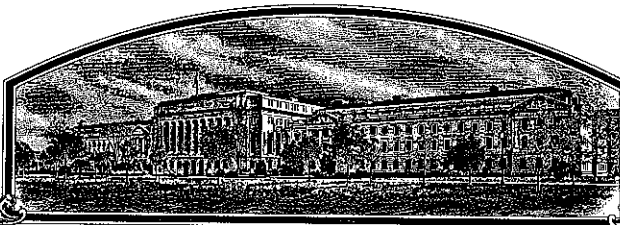


No.



9200075

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Maryland Agricultural Experiment Station

**Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS SEED OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'Manokin'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this *29th* day of April in the year of our Lord one thousand nine hundred and ninety-four.

Attest:

Kenneth H. Evans
Commissioner

Plant Variety Protection Office
Agricultural Marketing Service

Mike Egan
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Maryland Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. Md 83-5008	3. VARIETY NAME Manokin
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) Maryland Institute for Agriculture & Natural Resources 1116 Symons Hall, University of Maryland College Park, MD 20742		5. PHONE (Include area code) (301) 405-1210	FOR OFFICIAL USE ONLY VPPO NUMBER <div style="font-size: 24pt; text-align: center;">9200075</div> <div style="border: 1px solid black; padding: 2px;"> F I L I N G Date <u>Jan. 22, 1992</u> Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M. F E E S Filing and Examination Fee: \$ <u>2150.-</u> Date <u>Jan. 22, 1992</u> Certificate Fee: \$ <u>250.00</u> Date <u>April 14, 1994</u> </div>
6. GENUS AND SPECIES NAME Glycine max (L.) Merr.	7. FAMILY NAME (Botanical) Leguminosae		
8. CROP KIND NAME (Common Name) Soybean	9. DATE OF DETERMINATION November, 1983		
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) State Experiment Station		11. IF INCORPORATED, GIVE STATE OF INCORPORATION	
12. DATE OF INCORPORATION			
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Dr. William J. Kenworthy Agronomy Department University of Maryland College Park, MD 20742			

(301) 405-1324
PHONE (Include area code):

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

- a. ☒ Exhibit A, Origin and Breeding History of the Variety.
- b. ☒ Exhibit B, Novelty Statement.
- c. ☒ Exhibit C, Objective Description of Variety.
- d. ☐ Exhibit D, Additional Description of Variety.
- e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.
- f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office 1-22-92
- g. ☒ Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)
☒ YES (If "YES," answer items 16 and 17 below) ☐ NO (If "NO," skip to item 18 below)

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ FOUNDATION ☒ REGISTERED ☒ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES (If "YES," through ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?
☒ YES (If "YES," give names of countries and dates) U.S. Release date- August 1, 1991
☐ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

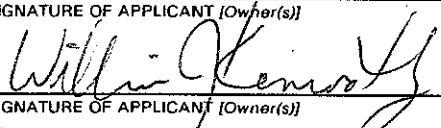

SIGNATURE OF APPLICANT [Owner(s)] 	CAPACITY OR TITLE Plant Breeder & Professor	DATE Jan. 21, 1992
SIGNATURE OF APPLICANT [Owner(s)] 	CAPACITY OR TITLE Associate Director MAES	DATE Jan. 22, 1992

EXHIBIT A - ORIGIN AND BREEDING HISTORY

'MANOKIN' SOYBEAN

Amended - May 12, 1993

MANOKIN is a F_4 -derived plant selection from the cross L70-L3048 x D74-7824. L70-L3048 was a selection from a cross of L15 (Wayne Rps₁) x D64-3146 made at the University of Illinois. D64-3146 was a selection from a backcross of D49-2491 (sister line of Lee) (5) x Hawkeye made at the USDA station in Stoneville, MS. The other parent of MANOKIN, D74-7824, was a selection from a cross of Forrest x D70-3001. D70-3001 is of the same parentage as Centennial. This cross was also made at Stoneville, MS.

The original cross was made at the Wye Research and Education Center, Queenstown, MD, during the summer of 1980. The F_1 plants were grown in the University of Maryland greenhouse complex to produce F_2 seeds. The F_2 progeny were advanced to the F_4 generation by single seed descent in Maryland and Puerto Rico. F_4 -derived lines were evaluated in Maryland in 1983, and Md83-5008 was identified as having a desirable plant type, resistance to a field population of cyst nematode, and uniform plant height, flower color, and pubescence color. Md83-5008 was tested for yielding ability in Maryland during 1984, in the Mid-Atlantic Regional Soybean Tests during 1985, and in the Southern Regional Soybean Tests from 1986-1991.

Breeder seed of MANOKIN was obtained by combining three sublines of Md83-5008 that were uniform in cyst nematode resistance, plant type, plant maturity, and color of flowers, pubescence, and pod wall. Md83-5008 was designated MANOKIN and foundation seed was produced in 1991 by foundation seed organizations in states participating in its release. Foundation seed will be distributed to certified seed growers for planting in 1992.

Observations indicate MANOKIN is uniform and stable within commercially acceptable limits. As is true with other soybean varieties, a small percentage of off-types or variants can occur within commercially acceptable limits for almost any characteristics during the course of repeated multiplication. Foundation seed of MANOKIN can contain up to 0.25% off-types for flower color, hilum color, pubescence color, or peroxidase reaction.

EXHIBIT A - Manokin Continued

MANOKIN has shown evidence of stability. The attached data are indicative of a stable variety.

From Regional Summary of Uniform Test IV-S										
	Yield, Bu/A				Maturity Days	Seed Size (g/100)	Plant Ht. (In.)	Seed Quality (Score)	Seed Composition	
	EC	UC	D	W					Protein (%)	Oil (%)
1989										
No of Tests	2	7	7	7	16	10	21	16	10	10
Douglas	48.4	32.5	28.7	41.4	128	19.0	30	3.0	40.9	21.3
Stafford	43.7	45.8	46.3	40.5	135	13.1	29	1.4	39.6	21.3
MANOKIN	47.5	47.8	54.5	39.7	137	13.8	32	1.7	39.0	21.1

1987-1989, 3 year means										
No of Tests	6	20	19	19	47	28	61	51	28	28
Douglas	37.4	31.5	35.0	42.7	128	18.5	31	3.0	41.0	21.6
Stafford	37.6	41.2	45.5	44.0	133	13.7	29	1.7	39.5	21.7
MANOKIN	40.0	43.1	50.4	43.8	134	13.8	31	1.8	38.7	21.4

*Score: 1=Best to 5=Worst

EC=East Coast, UC=Upper and Central South, D=Delta, W=West

EXHIBIT B - NOVELTY STATEMENT

MANOKIN SOYBEAN

To our knowledge MANOKIN most nearly resembles Douglas and Stafford. Differences include, but are not necessarily restricted to the following:

Manokin compared to Douglas and Stafford

1. Manokin has resistance to races 1 and 3 of soybean cyst nematode and has resistance to root-knot nematodes while Douglas and Stafford are susceptible to both nematode species.
2. Manokin (79 cm) is taller than Stafford (74 cm) and lodges more than either Stafford or Douglas.
3. Manokin is 6 days later in maturity than Douglas and 1 day later than Stafford.
4. Manokin is lower in seed protein (38.7%) than either Stafford (39.5%) or Douglas (41.0%).
5. Manokin (14g/100) has smaller seed than Douglas (19g/100).
6. Manokin has a determinate plant habit while Douglas has an indeterminate plant habit.
7. Manokin has white flowers, tan pods, and brown pubescence while Douglas has white flowers, brown pods, and brown pubescence; and Stafford has purple flowers, tan pods, and gray pubescence.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY
SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) Maryland Agricultural Experiment Station	TEMPORARY DESIGNATION Md 83-5008	VARIETY NAME Manokin
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) Maryland Institute for Agriculture and Natural Resources 1116 Symons Hall, University of Maryland College Park, MD 20742		FOR OFFICIAL USE ONLY PVPO NUMBER 9200075

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g.,). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)

3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)

2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)

4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

★ 2. SEED COAT COLOR: (Mature Seed)

1 = Yellow

2 = Green

3 = Brown

4 = Black

5 = Other (Specify) _____

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton')

2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ 4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

★ 5. HILUM COLOR: (Mature Seed)

1 = Buff

2 = Yellow

3 = Brown

4 = Gray

5 = Imperfect Black

6 = Black

7 = Other (Specify) _____

★ 6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow

2 = Green

★ 7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low

2 = High

★ 8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP1^a)

2 = Type B (SP1^b)

★ 9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis')

2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')

3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')

4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ 10. LEAFLET SHAPE:

1 = Lanceolate

2 = Oval

3 = Ovate

4 = Other (Specify) _____

11. LEAFLET SIZE:

☐ 31 = Small ('Amsoy 71'; 'A5312')
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

12. LEAF COLOR:

☐ 21 = Light Green ('Weber'; 'York')
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

★ 13. FLOWER COLOR:

☐ 1

1 = White

2 = Purple

3 = White with purple throat

★ 14. POD COLOR:

☐ 1

1 = Tan

2 = Brown

3 = Black

★ 15. PLANT PUBESCENCE COLOR:

☐ 2

1 = Gray

2 = Brown (Tawny)

16. PLANT TYPES:

☐ 31 = Slender ('Essex'; 'Amsoy 71')
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

★ 17. PLANT HABIT:

☐ 1

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

★ 18. MATURITY GROUP:

☐ 07

1 = 000

2 = 00

3 = 0

4 = I

5 = II

6 = III

7 = IV

8 = V

9 = VI

10 = VII

11 = VIII

12 = IX

13 = X

★ 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

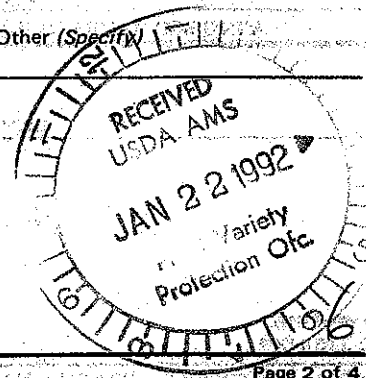
BACTERIAL DISEASES:

★ ☐ 0Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)★ ☐ 0Bacterial Blight (*Pseudomonas glycinea*)★ ☐ 0Wildfire (*Pseudomonas tabaci*)

FUNGAL DISEASES:

★ ☐ 0Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojina*)★ ☐ 0

Race 1

☐ 0 Race 2☐ 0 Race 3☐ 0 Race 4☐ 0 Race 5☐ Other (Specify)☐ 0Target Spot (*Corynespora cassiicola*)☐ 0Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☐ 0Powdery Mildew (*Microspheara diffusa*)★ ☐ 0Brown Stem Rot (*Cephalosporium gregatum*)☐ 0Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)

19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

FUNGAL DISEASES: (Continued)

- ★ Pod and Stem Blight (*Diaporthe phaseolorum* var; *sojae*)
- Purple Seed Stain (*Cercospora kikuchii*)
- Rhizoctonia Root Rot (*Rhizoctonia solani*)
- Phytophthora Rot (*Phytophthora megasperma* var. *sojae*)
- ★ Race 1 Race 2 Race 3 Race 4 Race 5 Race 6 Race 7
- Race 8 Race 9 Other (Specify) _____

VIRAL DISEASES:

- Bud Blight (Tobacco Ringspot Virus)
- Yellow Mosaic (Bean Yellow Mosaic Virus)
- ★ Cowpea Mosaic (Cowpea Chlorotic Virus)
- Pod Mottle (Bean Pod Mottle Virus)
- ★ Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

- Soybean Cyst Nematode (*Heterodera glycines*)
- ★ Race 1 Race 2 Race 3 Race 4 Other (Specify) _____
- Lance Nematode (*Hoplolaimus Colombus*)
- ★ Southern Root Knot Nematode (*Meloidogyne incognita*)
- ★ Northern Root Knot Nematode (*Meloidogyne Hapla*)
- Peanut Root Knot Nematode (*Meloidogyne arenaria*)
- Reniform Nematode (*Rotylenchulus reniformis*)
- OTHER DISEASE NOT ON FORM (Specify): _____

20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

- ★ Iron Chlorosis on Calcareous Soil
- Other (Specify) Salt tolerance = Lee

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

- Mexican Bean Beetle (*Epilachna varivestis*)
- Potato Leaf Hopper (*Empoasca fabae*)
- Other (Specify) Soybean looper

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	Douglas	Seed Coat Luster	Essex
Leaf Shape	Essex	Seed Size	Stafford
Leaf Color	Ripley	Seed Shape	Williams 82
Leaf Size	Douglas	Seedling Pigmentation	Williams

23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/POD
				CM Width	CM Length	% Protein	% Oil		
Manokin Submitted	134	2.4	79			38.7	21.4	14	2.2*
Stafford Name of Similar Variety	133	1.6	74			39.5	21.7	14	2.1*

PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

*Average 3 plants

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A₂ in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

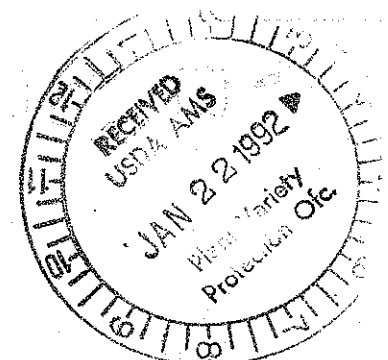


EXHIBIT E - STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

The variety MANOKIN was developed by Dr. William J. Kenworthy, an employee of the University of Maryland whose research program and salary is primarily funded by the Maryland Agricultural Experiment Station, Maryland Institute for Agriculture and Natural Resources. By agreement between the employee and the Maryland Agricultural Experiment Station, all rights to any variety or germplasm developed by an employee are assigned to the Maryland Agricultural Experiment Station. No rights to such varieties or germplasm are retained by the employee.